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SECURITY CLASSIFICATION OF THIS PAGE (When Date Entered)

REPORT DOCUMENTATION	PAGE _	READ INSTRUCTIONS BEFORE COMPLETING FORM
I. REPORT NUMBER WHOI-82-16	2. GOVT ACCESSION NO. AD-R1176 99	1. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Substite) A COMPILATION OF MOORED CURRENT MI WHITE HORSE PROFILES AND ASSOCIATION		
OBSERVATIONS, VOLUME XXIX (INDEX,	6. PERFORMING ORG. REPORT NUMBER 8. CONTRACT OR GRANT NUMBER(s)	
Ellen Levy, Ann Spencer, Gerald No Gretchen Hund and James R. Luyten	NO0014-76-C-0197; NR 083-400 ATM 78-21491	
Woods Hole Oceanographic Institut Woods Hole, Massachusetts 02543	16. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR 083-400	
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE
NORDA/National Space Technology La	aboratory	April 1982
Bay St. Louis, MS 39529	13. NUMBER OF PAGES	
14. MONITORING AGENCY NAME & ADDRESS(If different	from Controlling Office)	18. SECURITY CLASS. (of this report)
		15a, DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

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ELECTE JUL 2 3 1982

17. DISTRIBUTION STATEMENT (of the obstract entered in Block 20, If different from Report)

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18. SUPPLEMENTARY NOTES

This report should be cited as: Woods Hole Oceanog. Inst. Tech. Rept. WHOI-82-16.

- 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
 - 1. Ocean currents
 - 2. Ocean temperatures
 - 3. Indian Ocean

20. ABSTRACT (Continue on reverse olds if necessary and identify by block number)

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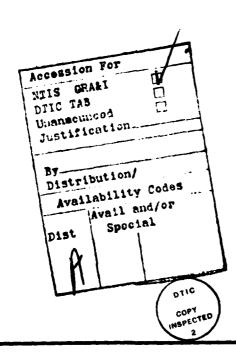
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Basic data from the current meters are presented in statistical tables and graphically as scatter plots, progressive vector plots, spectral plots and time series plots. Filtered time series are shown in composite displays. Time series plots are shown for the inverted echo sounder.

Basic White Horse data are presented as east and north velocity component profiles, potential temperature and salinity profiles, and potential temperature versus salinity diagrams.



A COMPILATION OF MOORED CURRENT METER DATA, WHITE HORSE PROFILES AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME XXIX (INDEX, 1979)

Ву

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April 1982

TECHNICAL REPORT

Prepared for the Office of Naval Research under Contract N00014-76-C-0197; NR 083-400 and for the National Science Foundation under Grant ATM 78-21491.

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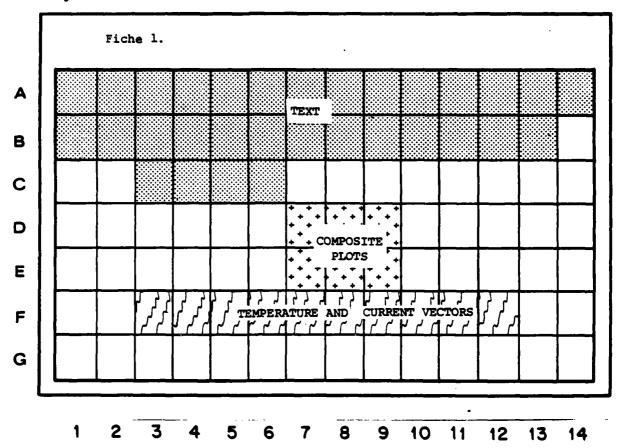
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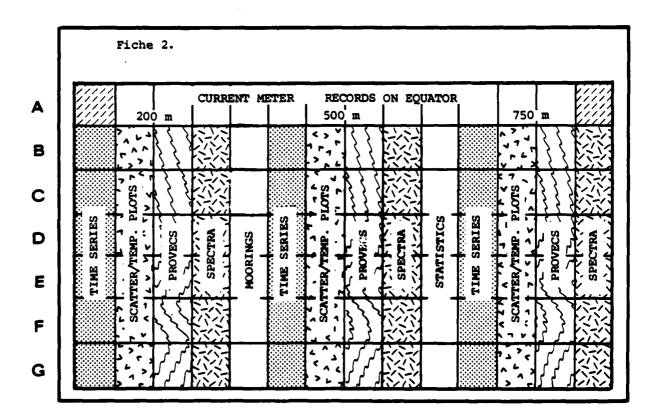
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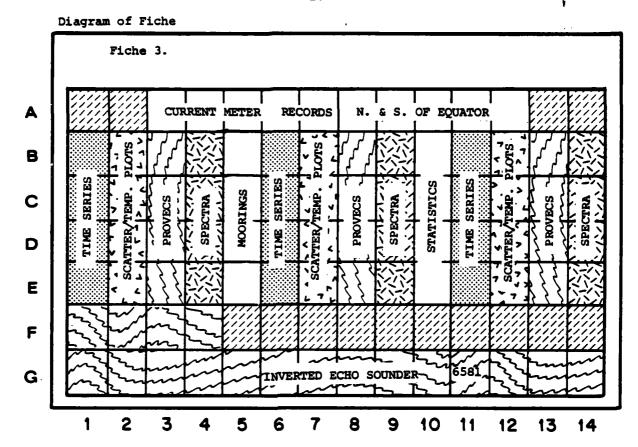
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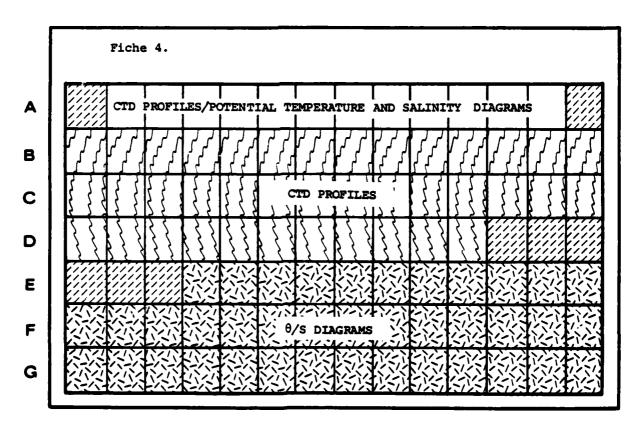
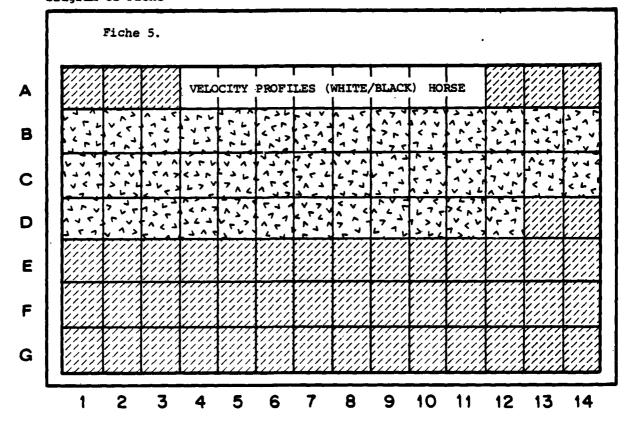


Diagram of Fiche



ACKNOWLEDGMENTS

Many people should share the credit for the high quality of data obtained from the instruments set during this experiment; the people in the Buoy Group instrument shop, those who worked on mooring hardware and design, and those who contributed to the development of the White Horse system.

The authors also wish to thank the officers and crew of the R/V Columbus Iselin for their assistance in mooring deployment and those of the R/V Marion Dufresne for their assistance in mooring recovery. Michele Fieux is to be thanked for providing the data from the French mooring.

The experiment was supported jointly by the Ocean Science and Technology Division of the Office of Naval Research (contract number N00014-76-C-0197, NR 083-400) and the National Science Foundation (grant number ATM 78-21491).

PREFACE

This volume is the twenty-ninth in a series of Data Reports presenting moored current meter and associated data collected by the WHOI Buoy Group.

Volumes I-VII present data prior to 1969 and are not listed below.

Volumes I through XXVIII present data obtained during the years 1969-1978, arranged either by year or experiment (see notes).

A data directory and bibliography for the years 1963-1978 has been published, as WHOI Technical Report 79-88.

Volume XXIX presents data from the INDEX Experiment, 1979.

Volume No.	WHOI Ref. No.		Notes Year Experiment
VIII XI	75–7 75–68	Pollard, R.T. and S. Tarbell Tarbell, S., M. G. Briscoe and D. Chausse	1970 Array Data 1973 IWEX Array
X XI	76–40 76–41	Tarbell, S. Tarbell, S.	1969a measurements 1969b measurements
IIX	76-101	Chausse, D. and S. Tarbell	1973 MODE Array
XIII	77–18 77–41	Tarbell, S. and A. W. Whitlatch Tarbell, S., R. Payne and R. Walden	1970 Measurements 1976 mooring 592 Saint Croix
	77-56	Tarbell, S. and A. W. Whitlatch	1971 measurements
XVI	78–5	Tarbell, S. and A. Spencer	1971-1975 MODE Site
IIVX	78–49	Tarbell, S., A. Spencer and R. E. Payne	1975-1977 POLYMODE Array II
XVIII	79–65	Tarbell, S., M. G. Briscoe and R. A. Weller	1978 JASIN
XIX	79–34	Spencer, A., C. Mills and R. Payne	1974-1975 POLYMODE Array I
XX	79-56	Spencer, A.	1974 Rise Array
	79-85	Mills, C. and P. Rhines.	1978 W.B.U.C.
XXI	79-87	Tarbell, S. and R. Payne.	1973 measurements
XXIII		Tarbell, S. and R. Payne.	1978 POLYMODE Array III
XXIV	80-41	Spencer, A. , K. O'Neill and J. R. Luyten	1976 INDEX
XXV	81–12	Spencer, A., E. D'Asaro and L. Armi	1977 B.B.L. Expt.
IVXX	81-45	Chausse, D. and R. Payne	1972 measurements
XXVII		McKee, T., E. Francis and N. Hogg	1975,78 topographic expts.
XXVIII	81-73	Mills, C., S. Tarbell, W. B. Owens and R. Payne	1978 L.D.E.

PRESENTATION

The printed portion of the report contains introductory text and information about the instruments and data processing procedures. Tables and figures give summaries of the location of the instruments. Data are shown graphically in numerous composite displays.

These pages are also reproduced on Sheet 1 of the microfiche. Sheets 2 and 3 contain displays of the basic current meter data, including spectral plots, tables of statistics, time series plots, progressive vector diagrams and scatter plots. Sheet 3 also contains the inverted echo sounder plots.

The White Horse CTD profiles and e/S diagrams are shown on sheet 4, and velocity profiles are shown on sheet 5.

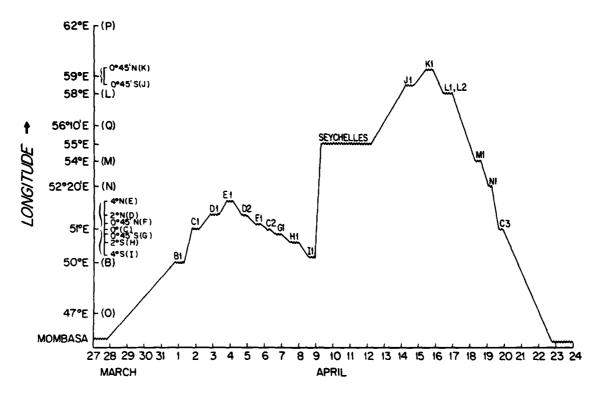
A detailed layout of the data on the microfiche sheets is shown on pages iii through v.

INTRODUCTION

Twelve moorings, with a total of 34 current meters and one inverted echo sounder were set in March and April 1979 and recovered in May 1980. Figure 1 shows the tracks of the Columbus Iselin on leg 1 and leg 2 of mooring deployment. Forty-one velocity and CTD profiles were made with the White Horse and Black Horse acoustic dropsondes between 31 March and 27 June 1979. See figures 1 through 3, and tables 1 through 3 and 5 through 6 for instrument locations, components and data quality. The data were collected as a contribution to the INDEX-79 experiment, a component of the First GARP Global Experiment (FGGE).

Scientific analyses of the data from this experiment have appeared in: Luyten and Roemmich (1982), Luyten (1982) and Luyten, Fieux and Gonella (1980).

COLUMBUS ISELIN, INDEX LEG I



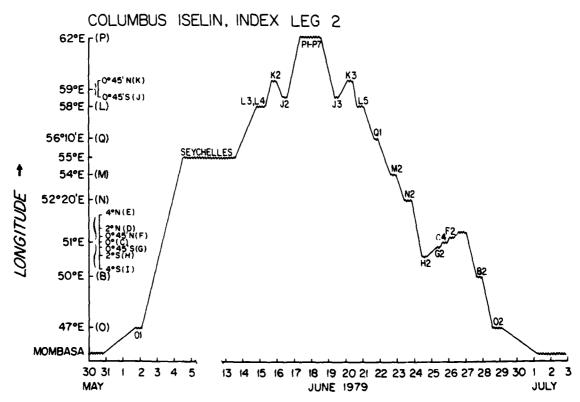


Figure 1

INSTRUMENTATION

Current Meters

The current meters described in this report were Vector Averaging Current Meters (VACMs), built by AMF SeaLink Systems (now EG&G SeaLink Systems), or Model 850 current meters built by Geodyne, now a part of Egerton, Germeshausen and Grier (EG&G).

Each time a pair of rotor magnets passes the sensing diode, the VACM samples compass and vane information and computes a measure of east and north water current components. These components are summed through the entire recording interval, usually 15 minutes, thus giving a true vector average. One complete rotor revolution initiates 8 compute cycles. Temperature is derived from a voltage-to-frequency converter (v/f), whose output frequency is related to the thermistor resistance at its input. The v/f output pulses are summed over the entire recording interval, thus averaging temperature. The thermistors are routinely calibrated before and after deployment and the temperatures are accurate to $\pm .01^{\circ}$ C (Payne et al., 1976). All variables are recorded on a cassette tape at the end of each recording interval.

The Model 850 current meter stores burst sampled data on magnetic tape cartridges. The instrument collects and stores 23 or 24 data cycles sampled at 5.27 second intervals. It then turns off for the remainder of the recording interval (usually 15 or 30 minutes). Model 850's which are modified to include temperature measurements accumulate the count from the temperature circuit from one 5.19 second period and store it at the beginning of each data burst.

Time was measured using a quartz crystal oscillator with a manufacturer's specified accuracy of ±1 second per day. All stated times are in UTC (Universal Coordinated Time). The instrument clock times were synchronized with UTC before mooring launch. After recovery, differences in the two times were noted.

The VACMs at 200 meters contained a pressure transducer, manufactured by Paine Instruments. It is a strain gauge with a rated accuracy of .05% of full scale. The instrument is routinely calibrated before deployment.

Dropsonde

The White Horse is a freely falling, acoustically self-positioning dropsonue used to determine vertical profiles of horizontal ocean currents (Luyten, Needell and Thomson, 1982).

The position of the dropsonde, relative to three bottom mounted transponders, is determined every twenty seconds. The rise and fall rates are approximately one meter per second, so the positions are determined at roughly twenty meter intervals. These data are interpolated onto a twenty-five meter grid and velocities are computed from successive grid points. Plots of the east and north velocity components are shown in the microfiche.

A second instrument, the Black Horse, is operationally identical to the White Horse, although it is configured in a slightly different

For details on the design, performance and evaluation of the White/Black Horse system see Luyten et al., 1982.

CTD

CTDs manufactured by Neil Brown Instrument Systems (Brown, 1975) are mounted in both the White Horse and Black Horse. Vertical profiles of temperature and salinity were obtained with both instruments. The CTD data were recorded once per second and the instruments were ballasted to sink at approximately one meter per second. Only the down traces were used to avoid contamination by the instrument wake. The data were interpolated onto a two decibar grid.

Hydrographic stations were occupied during the dropsonde profiles to allow calibration of the CTD conductivity sensor.

Plots of potential temperature and salinity versus pressure and potential temperature versus salinity are shown in the microfiche.

Inverted Echo Sounder

The inverted echo sounder measures the time for an acoustic pulse to travel from the instrument to the sea-surface and return. Variations in the travel time are related to variations in the thermal structure and are correlated with changing thermocline depth (Watts and Rossby, 1977). The instrument was located at a depth of 5084 meters (14 meters off the bottom). A burst of 32 travel times are recorded for each one hour recording interval. They are edited by an automatic process which rejects points greater than three standard deviations from the mean. Three variables are stored; the mean of the burst, the minimum value in the burst and a modal quantity based on moments of the Rayleigh distribution. For plotting, the values are further median-smoothed (the median of the point and its two neighbors are used). Plots are shown for all three variables over two three-week periods. A plot of the 24-hour gaussian filtered mean travel-time is shown for the duration of the series. The one-hour sampled median-smoothed mean travel time for the duration of the series is shown on microfiche.

MOORINGS

Details of mooring configuration are shown in Table 2. Mooring items are listed together with depths of the instruments and lengths in meters of the other line items. Depths are underlined, and lengths of items are not underlined.

The anchors, unless otherwise stated, are 3000 pound wet

weight cylinders.

The item "17" balls and chain" refers to glass flotation spheres of 17" diameter with hard hats, each one bolted to 3/8" chain at 1 meter intervals.

Figure 2 shows mooring locations and Tables 1,2 and 3 give summaries of the instruments, their depths and the quality of the data. Figure 3 shows the dep⁺hs of the instruments on the moorings and water depths.

See Heinmiller (1976) for a more complete description of WHOI moorings.

DATA PROCESSING

Current Meter

The data from the instrument tapes were transcribed to 9-track magnetic tapes, converted to scientific units, edited to remove launch and retrieval transients and bad points, and linearly interpolated across missing or erroneous data cycles.

WHOI data are identified by a mooring number, a sequential instrument position number (e.g., 6553 is the third instrument down on mooring 655), a letter to indicate the data version (e.g., 6553A is the first editing of 6553), and a number to indicate the time sampling interval for that data record (e.g., 6553A900 is the fifteen minute (900 seconds) averaged version).

Low passed versions of data series were formed by passing the data through a Gaussian filter with a 24 hour half-width, and then subsampling the filtered series once a day. The composite plots shown for each WHOI mooring use these filtered data series.

Dropsonde

Processing of the White/Black Horse data consists of:

- Transferring raw data from Sea-Data cassettes to floppy diskettes on an LSI-11 computer.
- Decoding data and separating into acoustic and CTD data files.
- 3. Editing CTD data and computing sound velocity profiles.
- 4. Editing travel time data and converting to slant ranges.
- 5. Computing positions relative to transponder net and rotating to true coordinates.
- Interpolating positions to 25 meter grid in vertical.
- 7. Computing and displaying the velocity profile.

The transponder coordinates are determined by a near surface survey with a towed hydrophone. The coordinates are determined by a least squares fit to the survey data (Hunt et al., 1974, Luyten et al.,1982).

The true orientation of the transponder net is determined by a least squares fit to the rotation matrix and surface current which best reconcile several ship tracks, as steered with those observed relative to the net.

A summary of the beacon locations and net orientations is presented in table 6. Table 5 contains a summary of the data quality for each profile. The profiles are identified by the net and a chronological increment (eg. 802 is the second profile at net B).

In table 5, the data quality note indicating the "4 millisecond problem" (4ms) means that data in one or more channels was lost. If two or more signals arrive at the receiver within four milliseconds of each other, then only one is actually recorded and any others are lost.

Depth

The depths of the current meters are computed in the standard way, ie. 1) The depth of the water at the anticipated anchor location is read from the Depth recorder at sea, prior to launch. 2) Adjustments are made to the wire lengths, if necessary. 3) Lengths of all mooring components are input to program NOYFB (Moller, 1976), which calculates all instrument depths.

In the experiment, the release on a mooring was used as the first beacon of the White Horse net. The net triangulation computations give the depth of the beacon. When this depth is added to the length of the wire attached to the anchor, the result is an independent measure of the water depth.

The two water depths are shown for most of the moorings in table 4. At mooring 655, where net A was aborted, and where net O was reset later, the mooring release was not used as a beacon. At mooring 658, the on-board depth record was not available. The release was used as beacon 2 of net C, so all depths are based on the beacon depth.

Computed depths and a depth based on the most frequent pressure are also given in Table 4 for the instruments at 200m (nominal). The depth is computed from the pressure using the formula from Saunders and Fofonoff (1976).

PROGRAMS

Time Series

Current meter variables versus time are presented graphically. The composite plots (Figures 5-20) are based on daily averaged time series.

Statistics

Statistics for each variable measured by the current meters are presented on microfiche, Sheets 2 and 3, in column 10. Mean, standard error, variance, kurtosis and extrema are given for all the variables; east and north covariance, correlation and other statistics are given for the vectors. For reference, note that a Gaussian random variable would have a kurtosis of three and a skewness of zero.

See Volume XVII (POLYMODE Array II) of this series for a more detailed discussion of these parameters.

Progressive Vector and Scatter Plots

Based on a daily averaged time series, the current vectors are placed tail-to-head so as to show the path that a perfect particle in a perfectly homogeneous flow would have travelled. Flow regimes and low frequency behavior show up well on this type of plot. The plot begins with an asterisk, the first day of each month is marked with a plus sign and every six months is annotated.

Every second point from the series is plotted in a scatter plot, in which east and north components are plotted as points on a polar diagram. The line drawn through the points is the principal axis. It has slope theta (e) (where theta is given by $\tan(2e) = (2\overline{u}\overline{v}) / (\overline{u}^2 - \overline{v}^2)$) and it passes though the point $(\overline{u}, \overline{v})$.

White Horse Plots

The east and north component profiles are plotted, with one point every 25 meters, for both the down and up traces.

The CTD data are plotted with one point every 2 decibars. The potential temperature and salinity are plotted versus pressure and the potential temperature is plotted versus salinity.

Vector Stick Plots

The 24-hour averaged current components are plotted as individual vectors along a time scale. Unless otherwise indicated, the vector orientation is such that east is upwards on the page.

Spectra

The horizontal kinetic energy (HKE) and temperature are displayed as spectra. The HKE spectrum is half of the sum of the spectra of the east and north components. It has the advantage of not being tied to a particular coordinate system. These plots are shown on microfiche. A spectra of east and north components plotted separately is shown in figure 4 on page 19 of the text. Five records at 200 m. are pieced together and averaged.

The HKE and temperature have units of $(cm^2/sec^2)/cph$ and $(^{\circ}C)^2/cph$ respectively. The spectra are all one-sided, i.e., the area under the spectrum is equal to the variance of the original record. The plots are log-log rather than 'variance preserving', i.e., the contributions of various frequency bands to the total variance are not in proportion to the displayed areas.

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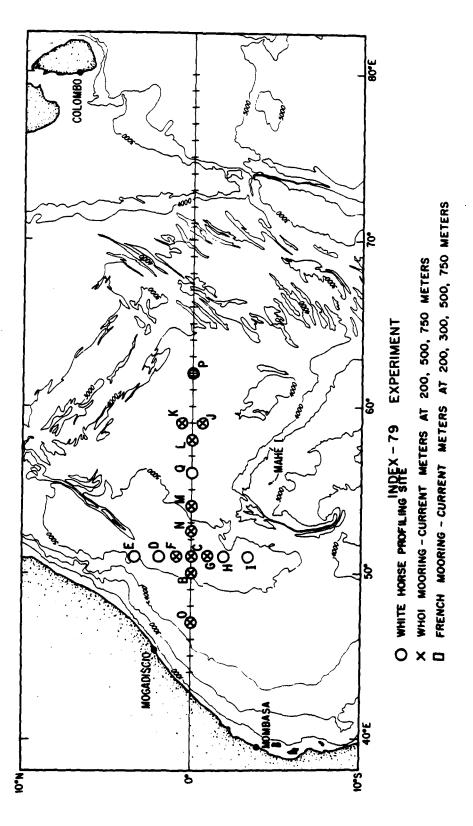


Figure 2

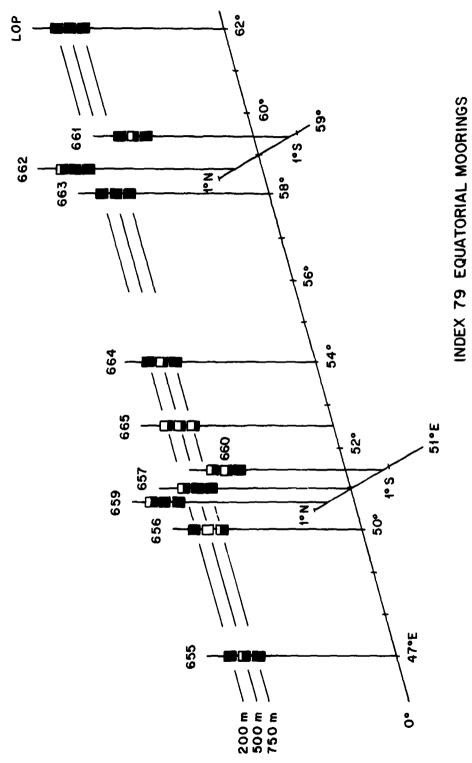


Figure 3

TABLE 1
SUMMARY OF MOORINGS

RECORD	DEPTH (M)	DATE SET (79)	DATE RET. (80)	LOCATION	NET	BOTTOM DEPTH (M)
6551 6552 6553	201 501 751	30–111	19-V	00° 4.9'N 46°54.1'E	-	4319
6561 6562 6563	200 500 750	31-111	17-V	00°00.0'N 50°00.0'E	В	5065
6571 6572 6573	205 505 755	01-IV	16-V	00°00.0'N 51°00.0'E	С	5096*
6581	5084	01-IV	16-V	00°00.0'N 51°02.0'E	Ε	5098
6591 6592 6593	206 506 756	05-1 V	17-V	00°45.0'N 51°00.0'E	F	5100
6601 6602 6603	195 495 745	06-IV	16-V	00°45.0'S 51°02.0'E	G	5082
6611 6612 6613	198 498 748	13-IV	11-V	00°47.0'S 59°06.0'E	J	4604
6621 6622 6623	277 577 827	15-IV	12 - V	00°43.0'N 59°00.0'E	K	4737
6631 6632 6633	199 499 749	16-IV	12-V	00°02.1'S 57°59.4'E	Ĺ	4730
MNHN24 MNHN28 MNHN31	7 455	10-V	09 - V	00°00.3'S 61°55.9'E	Р	*465 8

*....NOTE: See table

TABLE 1 (continued)
SUMMARY OF MOORINGS

RECORD #	DEPTH (M)	DATE SET (79)	DATE RET. (80)	LOCATION	NET	BOTTOM DEPTH(M)
6641 6642 6643	189 489 739	18-IV	14-V	00°00.6'S 54°00.6'E	М	4924
6651 6652 6653	188 488 738	19-I V	15-V	00°00.3'S 52°27.8'E	N	4994

TABLE 2
DEPTHS AND LENGTHS OF MOORING ITEMS

LINE	MOORING		M	OORING	5
#	COMPONENT	655	656	657	659 660
"					
01	Dadia floor	136		140	140 130
01 02	Radio float Radio	130			140 130
03	Light				
04	3/8" chain	2	2	2	2 2
05	3/16" wire	10	10	10	10 10
06	16" balls and chain	10	10	10	10 10
07	17" balls and chain	20	20	20	20 20
80	3/16" wire	20	20	20	20 19
09	VACM w/p	201	200	205	206 195
10	3/16" wire	265	265	265	265 265
11	17" balls and chain	11	11	11	11 11
12	3/16" wire	20	20	20	20 20
13	850 CM	501	500	505	506 495
14	3/16" wire	243	243	243	243 243 3 3
15	17" balls and chain	3 751	3 750	3 755	756 745
16	VACM	$\frac{751}{1000}$	1000	1000	1000 1000
17 18	3/16" wire 17" balls and chain	4	4	4	4 4
19	3/16" wire	1000	1000	1000	1000 1000
20	17" balls and chain	3	3	3	3 3
21	3/16" wire	1000	1000	1000	1000 1000
22	17" balls and chain	3	3	3	3 3
23	3/16" wire	400	800	800	1000 800
24	3/16" wire	20	20	200	50 50
25	3/16" wire	50	200	200	200 200
26	3/16" wire	20	200	20	20 200
27	5/8" nylon	9	20	4	11
28	17" balls and chain	10	12	12	12 12
29	Release	2	2	2	2 2 3 3
30	1/2" chain		3	3	3 3 10 10
31	3/4" nylon	10	10	10 5	5 5
32	1/2" chain	5 4319	5 5065	5054	5100 5082
33	Anchor	4319	3003	3034	2100 2005

TABLE 2 (continued)

DEPTHS AND LENGTHS OF MOORING ITEMS

LINE #	MOORING COMPONENT	661	662 662	00RING 663	664	665
01 02 03	Radio float Radio Light	133	212	144	124	123
04	3/8" chain	2	2	2	2	2
05	3/16" wire	10	10		10	10
06	16" balls and chain	10	10	10	10	10
07	17" balls and chain	20	20	20	20	20
08	3/16" wire	20	20	20	20	20
09	VACM w/P	198	<u>277</u>	199	189	188
10	3/16" wire	265	265	265	265	265
11	17" balls and chain	11	11	11	11	11
12	3/16" wire	20	20	20	20	20
13	850 CM	498	577	499	489	488
14	3/16" wire	243	243	243	243	243
15	17" balls and chain	3	3	3	3	3
16	VACM	748	827	749	739	738
17	3/16" wire	1000	1000	1000	1000	1000
18	17" balls and chain	4	4	4	4	4
19 20	3/16" wire 17" balls and chain	1000	1000	1000	1000	1000
21 22 23	3/16" wire Aandaraa 3/16" wire	724 1 20	1000	724 1 276	1000	1000
24 25 26	T/P 3/16" wire 17" balls and chain	256 3	3	3	3	2
27	3/16" wire	500	98	500	800	3
28	3/16" wire	200	385	200	100	800
29 30 31	3/4" nylon 3/16" wire 3/16" wire	50 20	98 50		200	10 50 100
32 33 34	3/4" nylon 3/16" wire 3/16" wire		10 98		10	20
35 36	5/8" nylon 3/16" wire	11	98	7 100		200
37 38 39	3/16" wire 17" balls and chain Release	12 2	11 2	100 11 2	12	12
40	1/2" chain	3	3	3	3	3
41	3/4" nylon	10	10	10	10	10
42	1/2" chain	5	5	5	5	5
43	Anchor	4604	<u>4737</u>	4730	4924	4994

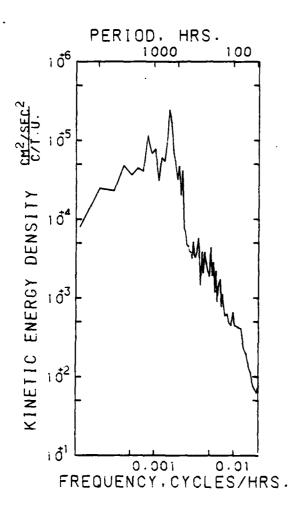
TABLE 3
DATA RETURN AND QUALITY

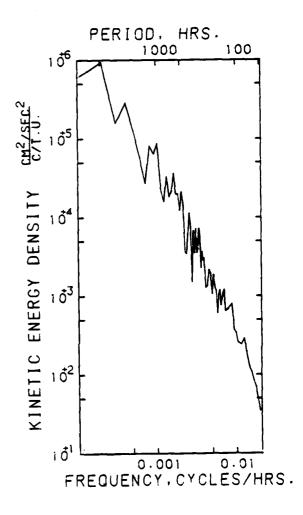
DATA RECORD	DATA	DATES	COMMENTS
6551	79-III-31	80- V-09	No speed 21 Mar. through 20 Apr.
6552	79-III-31	80- III-21	
6553	79-III-31	80- V-18	
6561 6562 6563	79-IV-01 79-IV-01	80- V-16 79- XI-24	Pressure no good after Feb. Data no good No data after 24 Nov.
6571	79-IV-02	79-VIII-23	no usable speed after 24 Aug. Instrument dies 26 Dec.
6572	79-IV-02	80- III-25	No speed after 25 Mar.
6573	79-IV-02	80- V-15	
6591	79-IV-06	79- V-26	Vane bad after 26 May
6592	79-IV-06	80- V-16	
6593	79-IV-06	80- V-16	
6601 6602 6603	79-IV-07 79-IV-07 79-IV-07	79- XII-30 79- VI-06 80- V-15	Speed quits 01 Jan. 1980 Only two months of data
6611	79-IV-14	80- V-09	Speed, temperature only; vane a problem
6612	79-IV-14	80- V-10	
6613	79-IV-14	80- V-10	
6621	79-IV-16	80- II-21	
6622	79-IV-16	80- V-11	
6623	79-IV-16	80- V-11	
6631	79-IV-17	80- V-10	Temperature may be off as much as .3°C.
6632	79-IV-17	80- V-11	
6633	79-IV-17	80- V-11	
6641	79-IV-19	80- V-13	Time is off by five days
6642	79-IV-19	79- V-28	
6643	79-IV-18	80- V-13	
6651	79-IV-19	79- VI-20	Vane loses all lower half values after 24 July.
6652	79-IV-19	80- V-14	
6653	79-IV-19	79- V-26	Temperature and rotor problems.

 $$\operatorname{\textsc{TABLE}}$4$$ Bottom Depth and 200 m. Depth Comparisons.

Mooring #	Bottom Depth (m) (from PGR)	Bottom Depth (m) (from net triangulation	Difference (m)	Depth 200m	Most Freq. Pres. dbars	Equivalent depth (m)
655	4319	4410	*	201	225	224
656	5065	5073	8	195	235	234
657	5054	5096	42	205	280	278
658	-	5098	_			
659	5100	5099	-1	206	230	229
660	5082	5097	15	195	227	226
661	4604	4606	2	198	225	224
662	4737	4734	-3	227	295	293
663	4730	4731	1	199	220	219
664	4924	4931	7	189	225	224
665	4994	4998	4	188	220	219

*NOTE: See text





AUTO SPECTRUM
179200MZ5TM N.COMP 5MERG
195 METERS
79-1V-10 TO 84-1X-29
5 PIECES WITH 200 ESTIMATES
PER PIECE. AVERAGED OVER
1 ADJACENT FREQUENCY BANDS

AUTO SPECTRUM
179200MZ5TM E.COMP SMERG
195 METERS
79-IV-10 TO 84-IX-29
5 PIECES WITH 200 ESTIMATES
PER PIECE. AVERAGED OVER
1 ADJACENT FREQUENCY BANDS

Figure 4

TABLE 5 WHITE HORSE DATA QUALITY

DROP	DATE 1979	HOUR	CODE	COMMENTS
A	Aborted			
B01 B02	March 31 June 27	2307 1738	*	
CO1 CO2 CO3 CO4	April 02 April 06 April 19 June 25	01 02 0307 1731 0437	* C B D7	No CTD data from the start Down noisy to 2750m. No Up-4ms problem.Beacon III out 3600-2780m.
D01 D02	April 03 April 04	0153 1637	* C D	CTD malfunctioned on Up at 1841m.
E01	April 04	0019	*	
F01 F02	April 05 June 26	1527 0023	C *	CTD data bad from the start
G01 G02	April 06 June 25	2000 0437	*	
H01 H02	April 07 June 24	1603 1425	* N 4	Beacon II totally out
101	April 08	1620	*	
J01	April 14	1004	U 4	Down-4ms problem:Beacon I s II out UP-Beacon III out 701-340m
J02 J03	June 16 June 19	0656 0916	*	0r -06acou 111 out /01-340m

CODE

- * Everything present and good, including CTD
- B Black Horse D Down used
- U Up used
- 4 4ms problem
- C CTD bad, but acoustics good N No good at all

TABLE 5 (continued) WHITE HORSE DATA QUALITY (continued)

DROP	DATE 1979	HOUR	CODE	COMMENTS
K01 K02 K03	April 15 June 15 June 19	1421 1437 2343	* * D 4	Up-4ms problem:Beacon I out,Down-1128-2813m. Beacon III out,I and II very noisy
L01 L02 L03 L04 L05	April 16 April 16 June 14 June 15 June 20	1348 1832 2125 0244 1540	* B * B *	Down 100-400m. data bad, Up-upper 100m data bad
M01 M02	April 18 June 22	0832 1600	B D 4	Up-4ms problem:3200-4745m. Beacon III very noisy Up-upper 200m Beacon III bad.
NO1 NO2	April 19 June 23	0425 1229	* B	·
001 002	June 01 June 28	2253 1506	*	
P01 P02	June 17 June 17	0858 1142	B *	Up-upper 200m very noisy
P02 P03 P04 P05 P06 P07	June 17 June 17 June 18 June 18 June 18	1142 1553 1936 0017 0403 0910	B * B * B *	Down-Beacon I intermittant noise
Q01	June 21	1714	U	Down very noisy

CODE

- * Everything present and good, including CTD B Black Horse
- D Down used

- U Up used
 4 4ms problem
 C CTD bad, but acoustics good
 N No good at all

TABLE 6
WHITE HORSE NET SUMMARY

NET	LOCATION	DATE OF SURVEY 1979	NET COORDINATES beac 1:x,y,z beac 2:x,y,z beac 3:x,y,z (meters)	ORIENTATION OF NET (deg. E of N)
A	00°05'N 46°54'E	ABORTED		
В	00°03'N 50°00'E	APRIL 1	0, 0,5054 3350, 0,5056 1949,3134,5056	89
С	00°02'N 51°00'E	APRIL 1	0, 0,5077 3734, 0,5086 2140,3596,5079	80
D	02°00'N 51°03'E	APRIL 2	0, 0,5087 3719, 0,5090 1707,3106,5085	112
Ε	04°02'N 50°57'E	APRIL 3	0, 0,4831 3888, 0,4857 2004,3407,4853	85
F	00°48'N 51°00'E	APRIL 5	0, 0,5080 3672, 0,5083 1656,3045,5084	96
G	00°45'S 51°04'E	APRIL 6	0, 0,5078 3860, 0,5080 1782,3382,5079	97
Н	01°56'S 51°11'E	APRIL 7 JUNE 24	0, 0,5079 4123, 0,5080 1996,3491,5080	81
I	03°49'S 51°01'E	APRIL 8	0, 0,5029 3961, 0,5070 1936,3271,5056	87

TABLE 6 (continued)

			•	
NET	LOCATION	DATE OF SURVEY	NET COORDINATES (meters)	ORIENTATION
J	00°45'S 59°00'E	APRIL 14	0, 0,4587 5237, 0,4546 3337,2758,4591	108
K	00°43'N 58°59'E	APRIL 15 JUNE 15	0, 0,4715 3559, 0,4722 1660,3123,4720	88
L	00°02'N 58°02'E	APRIL 16 JUNE 20	0, 0,4712 3819, 0,4709 1915,3243,4675	94
M	00°00'N 54°01'E	JUNE 22	0, 0,4912 3733, 0,4952 2026,3070,4957	91
N	00°01'S 52°29'E	JUNE 23	0, 0,4980 3581, 0,5056 1879,3003,5084	97
0	00°00'N 47°08'E	JUNE 1	0, 0,4391 3763, 0,4406 1810,3115,4390	94
ρ	00°01'N 62°05'E	JUNE 17	0, 0,4638 3833, 0,4564 2373,3247,4665	90
Q	00°01'N 56°12'E	JUNE 21	0, 0,4591 3722, 0,4611 1710,3208,4586	97

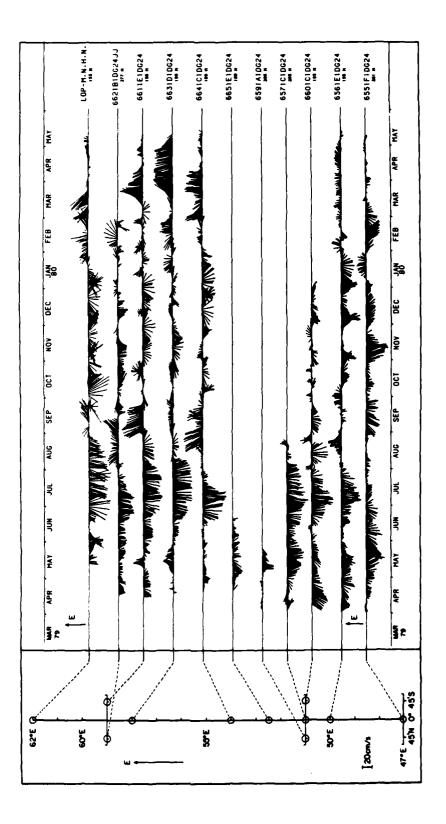


Figure 5

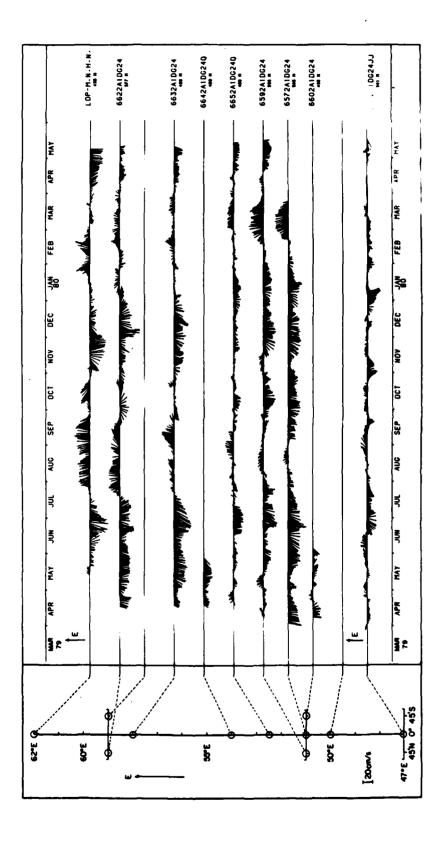


Figure 6

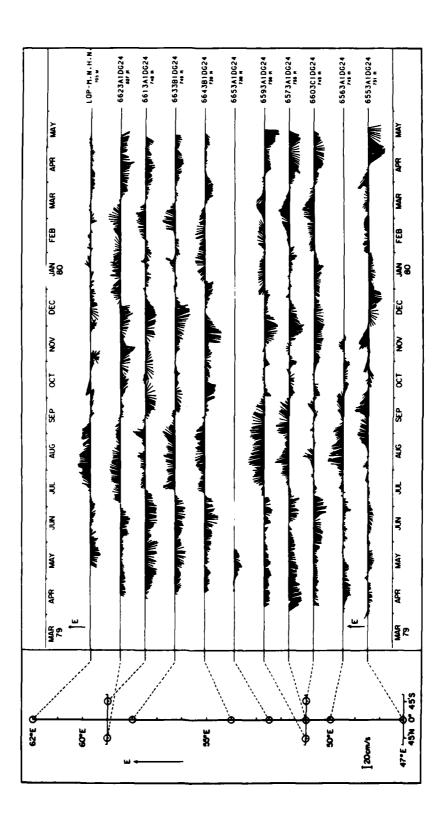


Figure 7

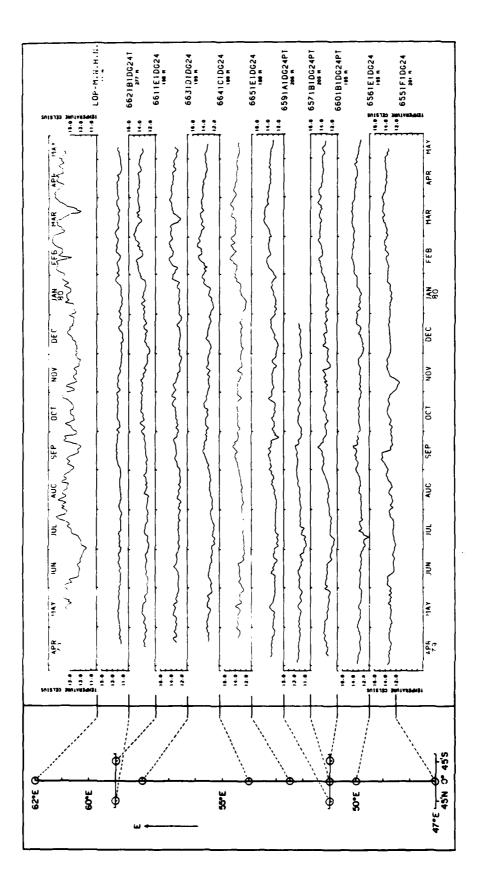


Figure 8

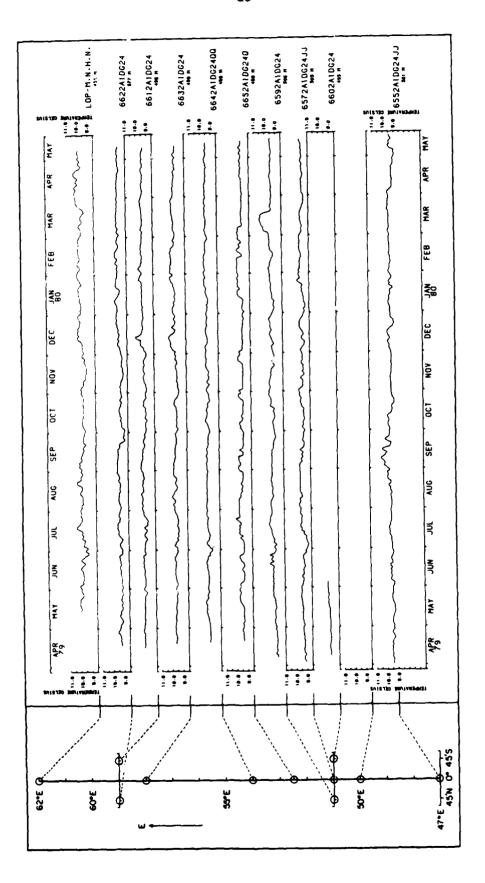


Figure 9

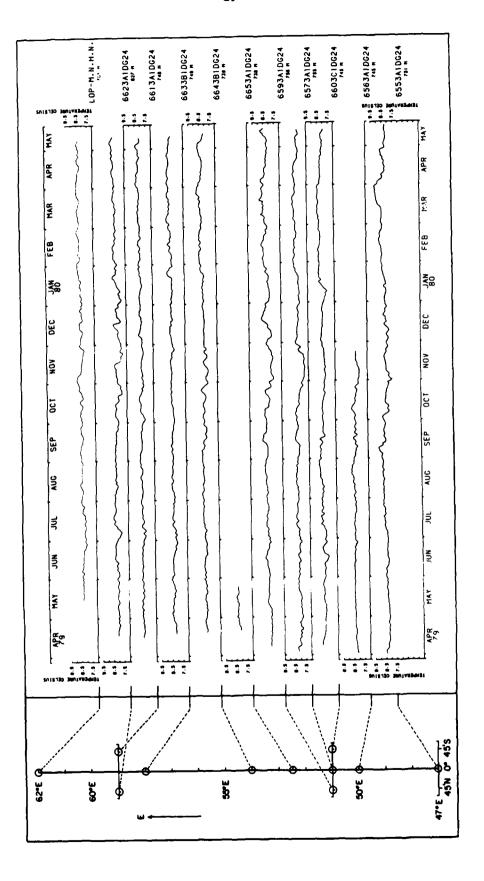


Figure 10

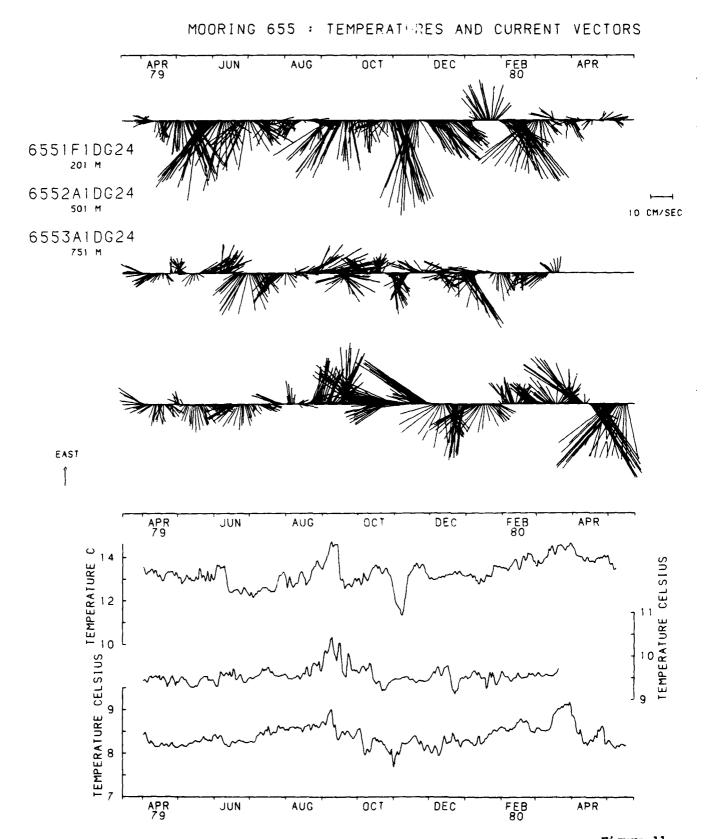
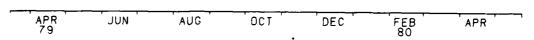
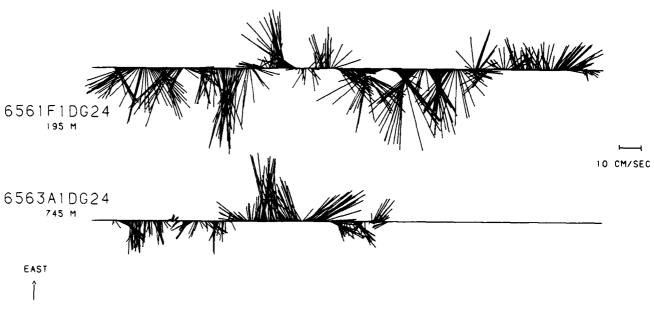


Figure 11

MOORING 656 : TEMPERATURES AND CURRENT VECTORS





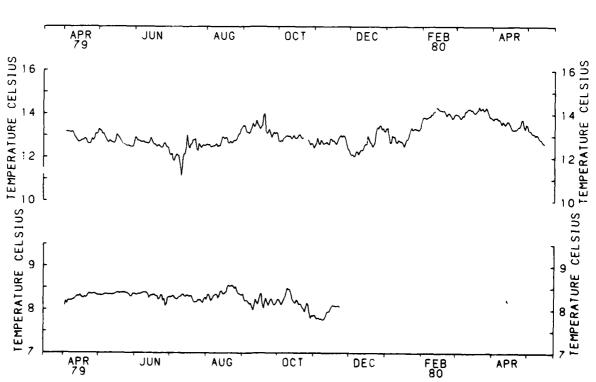


Figure 12

MOORING 657 : TEMPERATURES AND CURRENT VECTORS

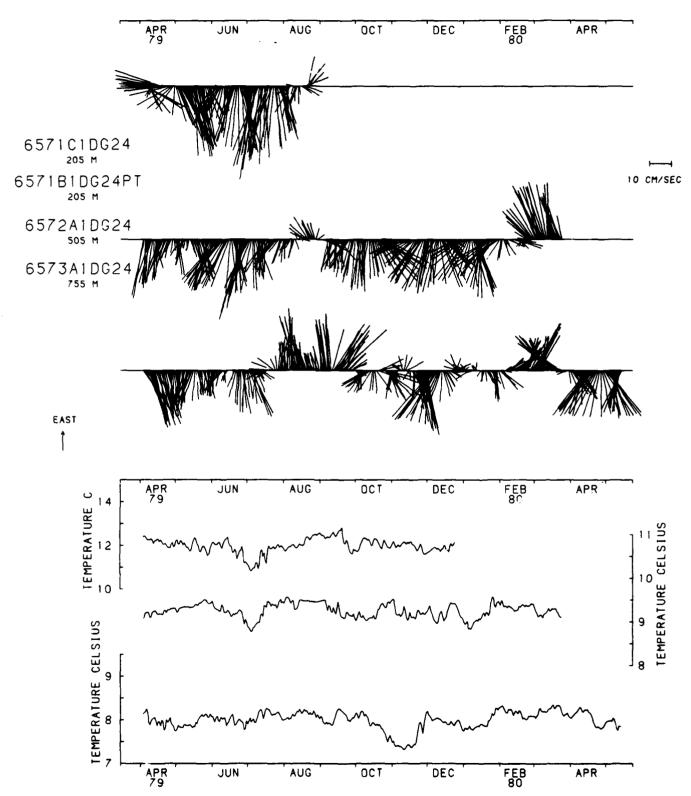


Figure 13

MOORING 659 : TEMPERATURES AND CURRENT VECTORS

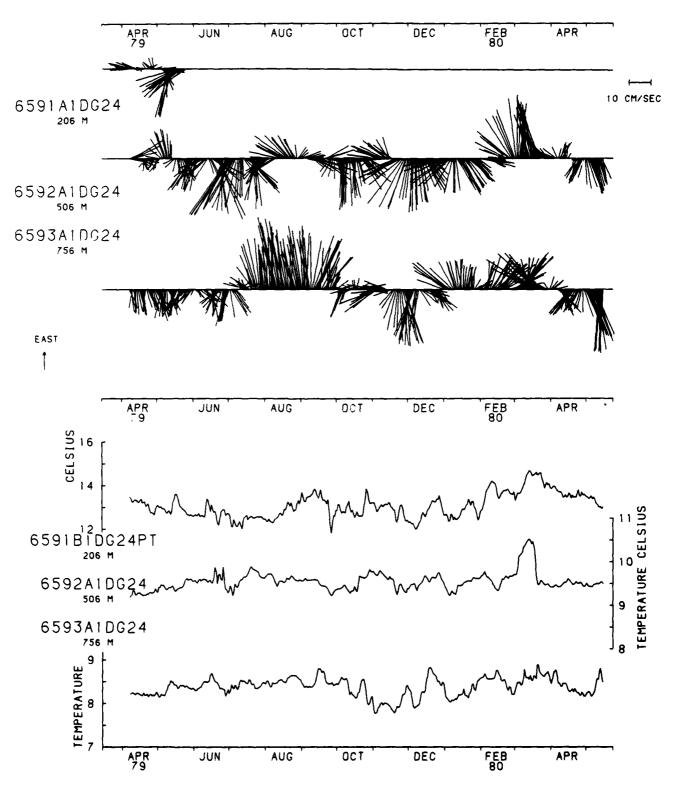


Figure 14

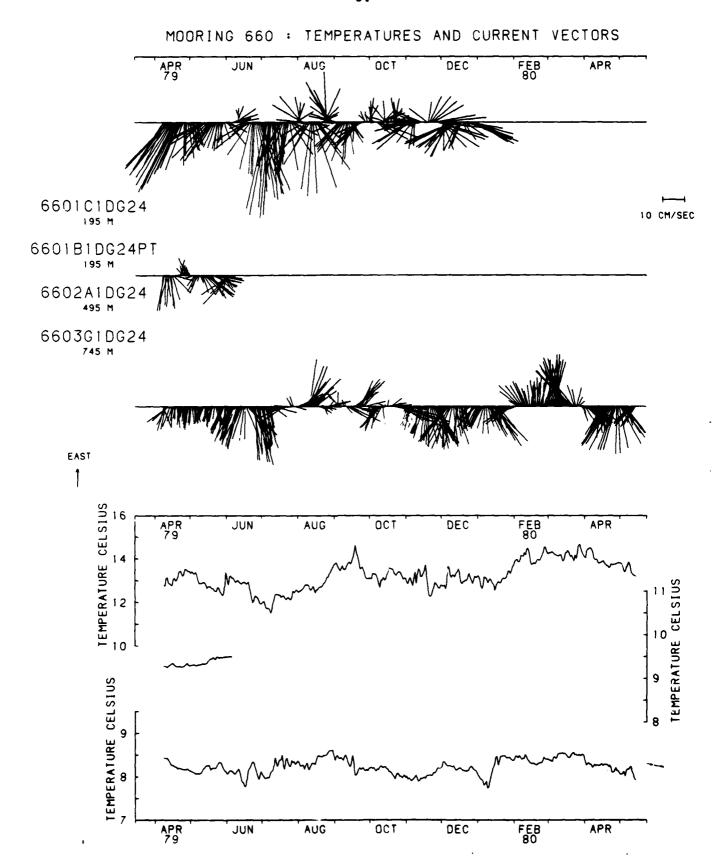


Figure 15

MOORING 661 : TEMPERATURES AND CURRENT VECTORS APR 79 FEB 80 JUN OCT AUG DEC APR 6611E1DG24 10 CM/SEC 6613B1DG24 748 M EAST FEB 80 JUN AUG OCT DEC APR CELSIUS P = = = = TEMPERATURE CELSIUS 12 661 TE1DG24 198 M 6612A1DG24 6613B1D024 TEMPERATURE JUN AUG OCT DEC APR

Figure 16

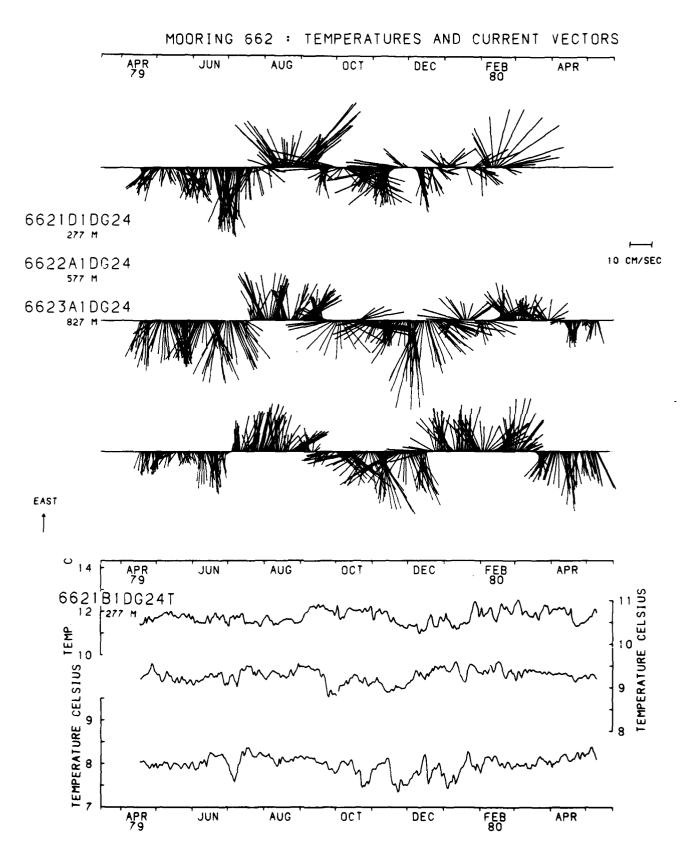


Figure 17

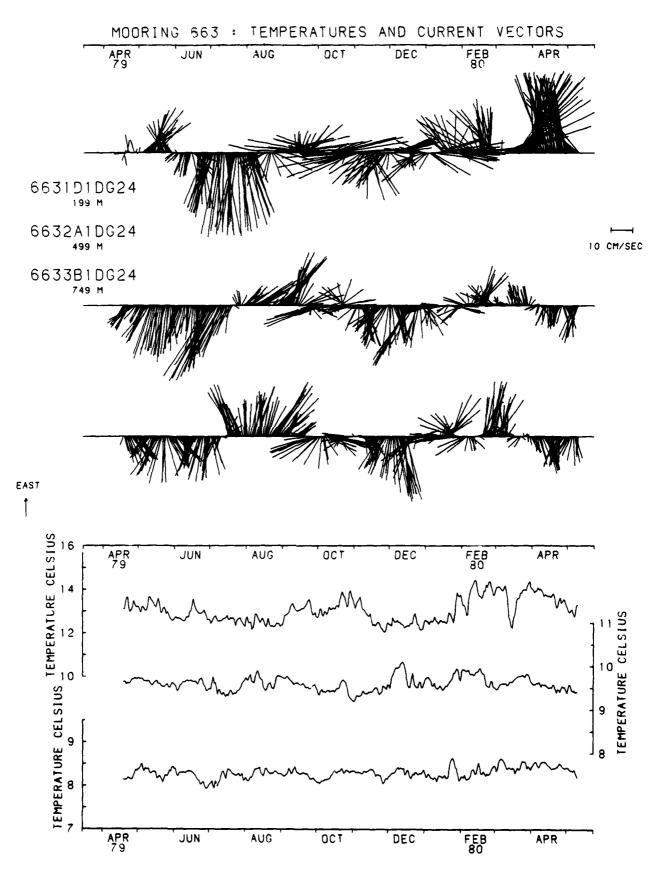


Figure 18

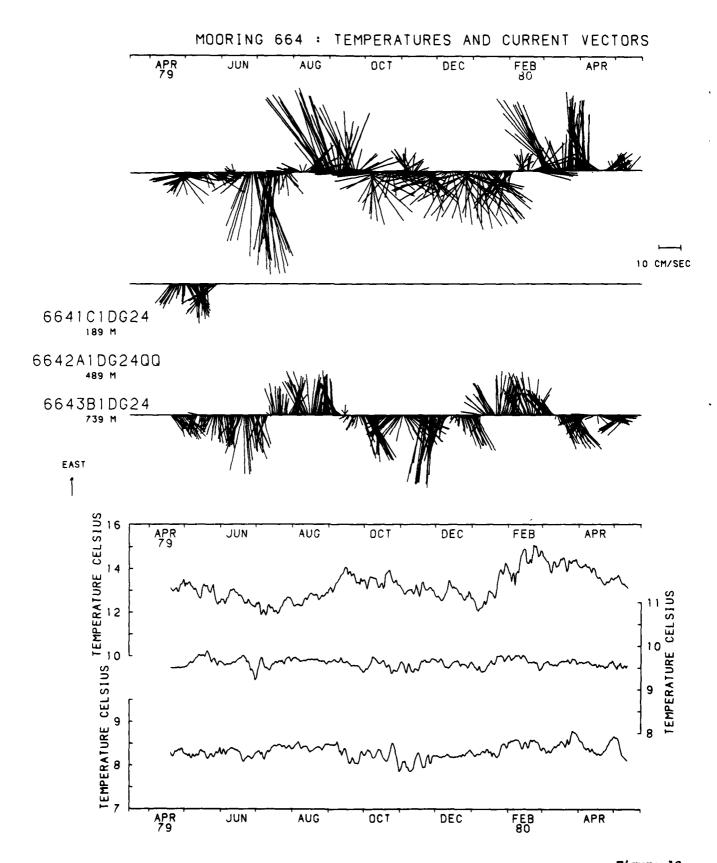
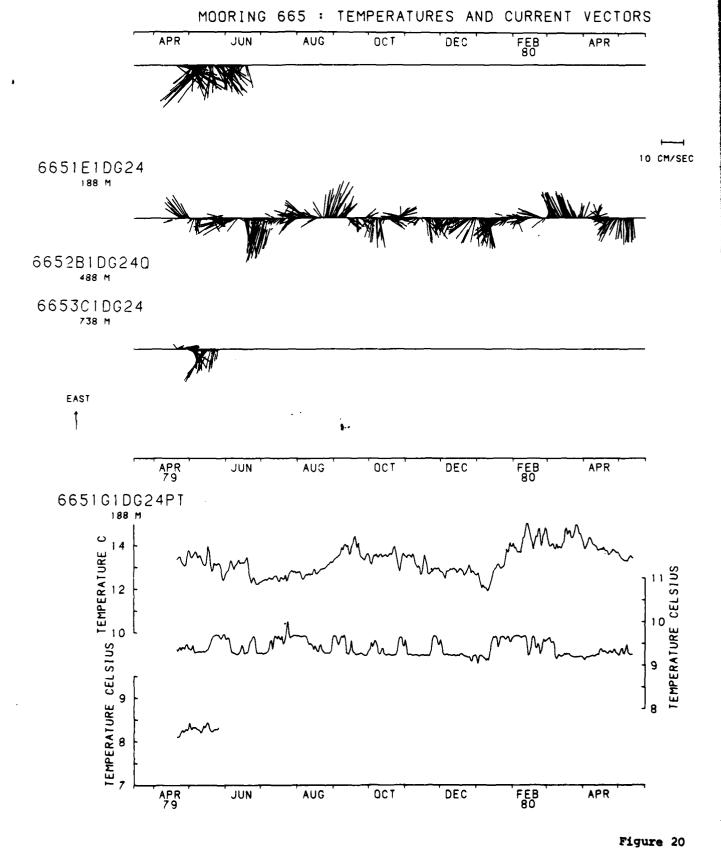


Figure 19



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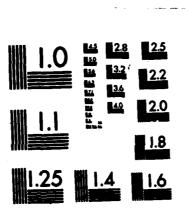
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SUPPLEMENTARY

INFORMATION

Office Memorandum . Woods hole oceanographic institution

Recipients of W.H.O.I. Technical Report 82-16, DATE: November 17, 1982 (INDEX 1979)

FROM : Ann Spencer/Jim Luyten

SUBJECT: Acknowledgments

We wish to expand the acknowledgments paragraph to recognize the participation of scientists under the scientific direction of Dr. Joseph Gonella. Please attach the enclosed label on page vi of the report and please accept our apologies for the inconvenience.

In particular we wish to acknowledge the support of the French Administration of "Terres Australes at Antarctiques Françaises". The observational program on board the R/V MARION DUFRESNE was carried out by numerous scientists from the Laboratoire d'Océanographie Physique under the scientific direction of Dr. Joseph Gonella.